# FOLDED LONGITUDINAL TORSIONAL HINGE FOR GIMBALED MEMS MIRROR

ABSTRACT OF THE DISCLOSURE

In a gimbaled micromachined micromirror array optimized for parallel-plate electrostatic operation, longitudinal-type gimbal hinge elements are provided in which a plurality of torsional longitudinal hinge elements are arranged in an array parallel to the axis of rotation and which are linked together by rigid lateral brace sections. In primary embodiment the hinge elements are arranged in a double gimbal configuration. Specific embodiments of the hinge elements are simple longitudinal, compound longitudinal, stacked simple longitudinal, and stacked compound longitudinal. The longitudinal hinges may be used with various types of mirrors including circular or rectilinear, recessed or nonrecessed, where the hinges are connected in either a symmetric or asymmetric configuration relative to one another, as hereinafter illustrated by way of a subset of examples. A preferred embodiment of a mirror structure suitable for an array structure according to the invention is a nonstacked compound longitudinal hinge symmetrically connected to a circular nonrecessed electrostatically-actuatable parallel plate mirror within a substantially circular ring hinged in substantially the same way to form a double gimbaled structure.

FIGURE 2

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